

ABSTRACT OF THE DISCLOSURE

When an optical waveguide is formed by focused femtosecond laser pulses in a pure silica glass to induce a refractive index increase region, a pulse width of femtosecond laser pulses are changed, a peak power of femtosecond laser pulses at the focal point is changed, or both the pulse width and the peak power are changed simultaneously. Under conditions where a pulse width of the femtosecond laser pulses is in a range of 210 to 420 fs and a peak power at the focal point is not greater than $8.7 \times 10^{11} \text{ W/cm}^2$, an optical waveguide having a mode field of 10 to 14 μm such that an aspect ratio is 1 (one) can be obtained. By doing this, it is possible to control a mode field diameter of an optical waveguide and an aspect ratio of the mode field diameter.